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10/510,980	10/13/2004	Werner Liedy	PAT 2480W-2	2203
42534	7590	12/08/2008	EXAMINER	
BORDEN LADNER GERVAIS LLP			TAI, XIUYU	
Gail C. Silver			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/510,980	Applicant(s) LIEDY, WERNER
	Examiner Xiuyu Tai	Art Unit 1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 13 October 2004.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 14-17,23-27 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 14-17, 23-27 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1668)
 Paper No(s)/Mail Date _____

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date _____

5) Notice of Informal Patent Application
 6) Other: _____

DETAILED ACTION***Response to Arguments***

1. Due to applicant's amendment, objection to specification is withdrawn.
2. Due to applicant's amendment, rejection to claim 14 under 35 U.S.C.112 is withdrawn
3. In response to the argument that the photocatalytic body disclosed by Ogata is a single body having both light storing and photocatalytic elements, it should be noted that Ogata teaches a method for improving the binding ability of TiO₂ to a substrate as demonstrated in examples. However, Ogata also teaches that it is advantageous to utilize photocatalyst in the form of powder as suspended in a solution due to the greater surface area for better photocatalytic activity (col. 1, line 16-19) and further indicates that the photocatalyst body can be a mixture of the particles of light-emitting ceramic with photocatalyst body (col. 5, line 31-53). Therefore, Ogata inherently teaches that the photocatalytic function can be achieved from the photocatalytic body comprising the mixture of photocatalyst particles and light-emitting ceramic particles.
4. In response to the argument that the reference of Stone is related to a very different field of endeavor, it should be noted that Stone teaches that it is essential to regenerate/recharge the light-emitting material or phosphorescent material by exposing to light source due to the limited afterglow time (col. 2, line 53-55). Although Stone disclose a self-illuminated case for a flashlight, the reference teaches a self-illuminated phosphorescent material. At least from this

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end of application, the reference of Stone is related to phosphorescent material which is analogous to light-emitting material.

5. Applicant's arguments with respect to claim14-27 have been considered but are moot in view of the new ground(s) of rejection necessitated by applicant's amendment.

6. The amendment filed 8/29/2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: claim 26 cites "phosphorescent half-time", however the instant specification does not define phosphorescent half-time rather "afterglow time".

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 26 and 27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Claim 26 contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The instant specification does not define "phosphorescent half-time"

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claim 23-27, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (U.S. 6, 251,264) in view of Ogata et al (U.S. 6,107,241) and further in view of Stone (U.S. 4,210,953).

12. Regarding claim 23, Tanaka et al discloses a method for purifying water containing organic matter by photo-catalyst particles (abstract). The method comprises steps of: (1) providing solid photo-catalysts particles (col. 6, line 62--63); (2) suspending the photocatalysts in a liquid medium (col. 6, line 65-67).

Tanaka fails to teach steps of providing microradiators, charging the microradiators, transporting the microradiators, and activating the photocatalysts by means of microradiators. However, Ogata et al disclose a photocatalytic body having a good photocatalytic function. Ogata teaches that it is advantageous to

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utilize photocatalyst in the form of powder as suspended in a solution due to the greater surface area for better photocatalytic activity (col. 1, line 16-19) and further discloses that a mixture of light-emitting ceramic particles with photocatalyst can achieve photocatalytic function by exciting photocatalytic particles by means of UV light radiated from light emitting ceramic particles (col. 5, line 31-53; i.e. transporting the microradiator to the photocatalysts and activating photocatalytic by means of the light emitted by the microradiators). Ogata inherently teaches that the photocatalytic function can be achieved from the photocatalytic body comprising the mixture of photocatalyst particles and light-emitting ceramic particles. Ogata also indicates that it is advantageous to incorporate light-emitting ceramic particle with photocatalytic particles because the photocatalytic function is continued if the UV irradiation against the photocatalytic body is interrupted (col.5, line 59-60). Therefore, it would be obvious for one having ordinary skill in the art to include steps of providing light-emitting ceramic particles, mixing light-emitting ceramic particle with photocatalyst, and exciting photocatalytic particles by means of UV light radiated from light emitting ceramic particles as suggested by Ogata in the method of Tanaka in order to achieve the photocatalytic function even under the condition of limited/interrupted UV radiation.

Tanaka/Ogata fails to teach to charge light-emitting ceramic. However, it is well known in the art that light-emitting ceramic particles radiate UV light after being charged from light source. As is evident by the teaching of Stone, it is essential to regenerate/recharge the light-emitting material or phosphorescent

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material by exposing to light source due to the limited afterglow time (col. 2, line 53-55). Therefore, it would be obvious for one having ordinary skill in the art to include a step of charging light-emitting ceramic particle by exposing to light source as suggested by Stone in the method of Tanaka/Ogata in order for light-emitting ceramic particles to initiate light-emitting ability.

13. Regarding claim 14, with the combined teaching of Tanaka/Ogata/Stone, the mixture of a photocatalyst and a light-storage light-emitting ceramic are suspended in an aqueous solution and exposed to the radiation of a UV light 2 to destroy the pollutant, which reads on the instant claim.

14. Regarding claim 15, Tanaka/Ogata teaches to separate two phases between solid particles and aqueous solution when all or practically all organic compounds are destroyed (col. 8, line 1-5 of Tanaka). Stone teaches that it is essential to regenerate/recharge the light-emitting material or phosphorescent material by exposing to light source due to the limited afterglow time (col. 2, line 53-55). Therefore, one having ordinary skill in the art would have realized to further separate light-emitting ceramic particles from the solid phase containing light-emitting ceramic particles and photocatalyst after the solid phase being separated from the aqueous phase as taught by Tanaka/Ogata in order to effectively regenerate the light-storage light-emitting ceramic, hence effectively destroying organic compounds in an aqueous solution while using Tanaka/Ogata method.

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15. Regarding claim 16, Tanaka specifically discloses a method for destroying organic compounds in aqueous solution (col. 7, line 1-3), reads on the instant claim.

16. Regarding claim 24, Tanaka teaches to carry out the photocatalytic reaction in a fluidized bed type reservoir 12 (Figure 5; col. 15, line 55), reads on the instant claim.

17. Regarding claim 25, the particle size in fluidized bed reservoir 12 is preferably to be in a range from 0.1 um to 0.1 mm (col. 16, line 29-32), reads on the instant claim.

18. Regarding claim 26, light-emitting ceramic particles of Ogata have particle size in the range of 20-50 um (col. 5, line 40-41) and the afterglow time is up 1000 min (col. 6, line 25), which are within the claimed ranges.

19. Regarding claim 27, light-emitting ceramic particles of Ogata have particle size in the range of 20-50 um (col. 5, line 40-41), which is within the claimed range.

20. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (U.S. 6, 251,264) and Ogata et al (U.S. 6,107,241) and Stone (U.S. 4,210,953) as applied to claim 23 above, and further in view of Fu et al (U.S. 6,287,993).

21. Regarding claim 17, TiO₂ is used as a catalyst in the method of Tanaka/Ogata/Stone t (col. 8, line 23 of Tanaka, but Tanaka/Ogata/Stone fail to teach microradiators that are glass particle doped with rare earth elements. However, Fu et al disclose long-lasting phosphorescent glass-ceramic containing

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SiO₂ and ZnO as basic ingredient and rare earth elements as an activator (abstract; col. 5, line 8-9 & 64-66). The reference states that a glass-ceramic containing rare earth element has a long-lasting phosphorescence, excellent chemical durability and light-proof characteristics (col. 1, line 63-65). Therefore, it would be obvious for one having ordinary skill in the art to utilize a long-lasting phosphorescent glass—ceramic as taught by Fu in lieu of the light storage-type light-emitting ceramic of Tanaka/Ogata/Stone in order to realize better long-lasting phosphorescence characteristics from glass-ceramic of Fu while carrying out the method of Tanaka/Ogata/Stone.

Conclusion

22. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuyu Tai whose telephone number is 571-270-1855. The examiner can normally be reached on Monday - Friday, 7:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/X. T./
Examiner, Art Unit 1795

11/17/2008

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795